Arrêt cardiaque – l'année en revue

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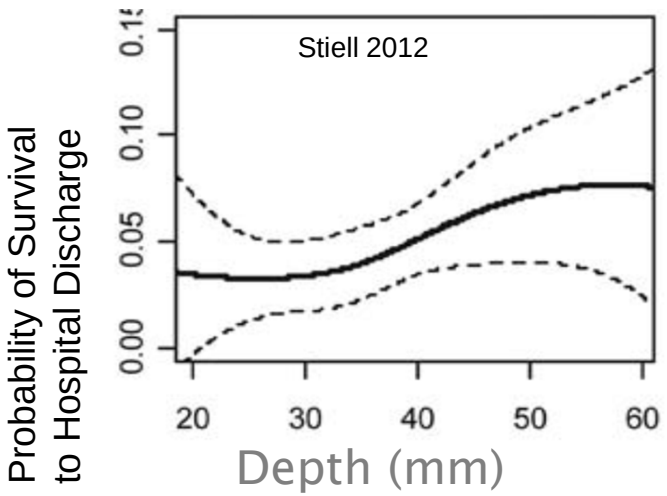
Arrêt cardiaque – l’année 2019 en revue

RCP
Fréquence et
Ventilation
Head-up CPR

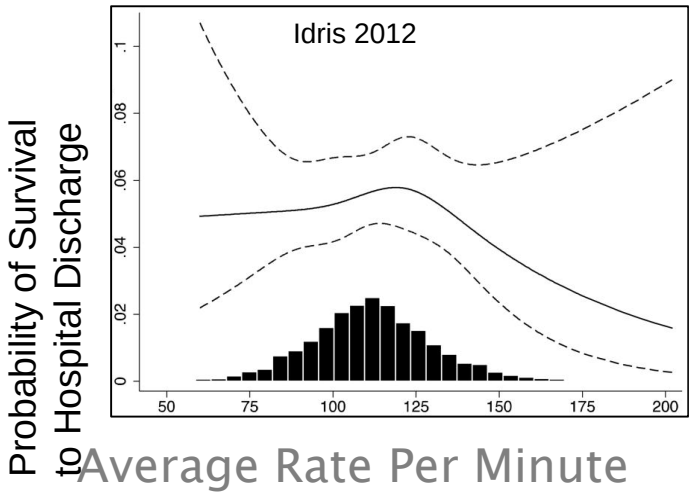
Post ROSC
Hémodynamique
Ventilation
Hypothermie

Variation de la qualité de la RCP

Compression Depth



Compression Rate



Les variations de fréquence et profondeur sont fortement liées au devenir

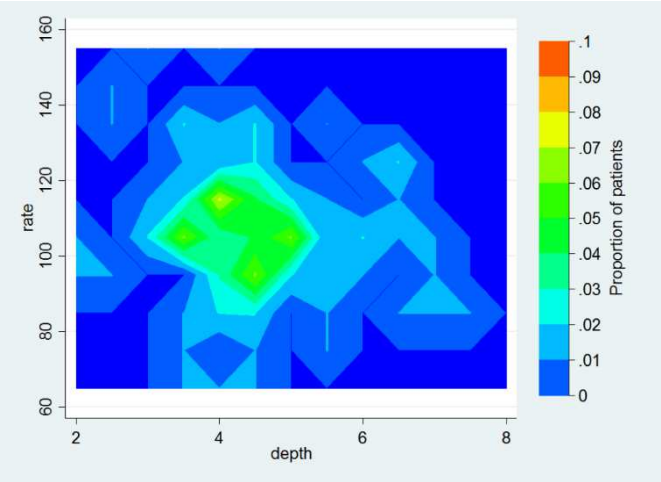
JAMA Cardiology | Original Investigation

Optimal Combination of Compression Rate and Depth During Cardiopulmonary Resuscitation for Functionally Favorable Survival

Sue Duval, PhD; Paul E. Pepe, MD, MPH; Tom P. Aufderheide, MD, MS; Jeffrey M. Goodloe, MD; Guillaume Debaty, MD, PhD; José Labarère, MD, PhD; Atsushi Sugiyama, MD, PhD; Demetris Yannopoulos, MD

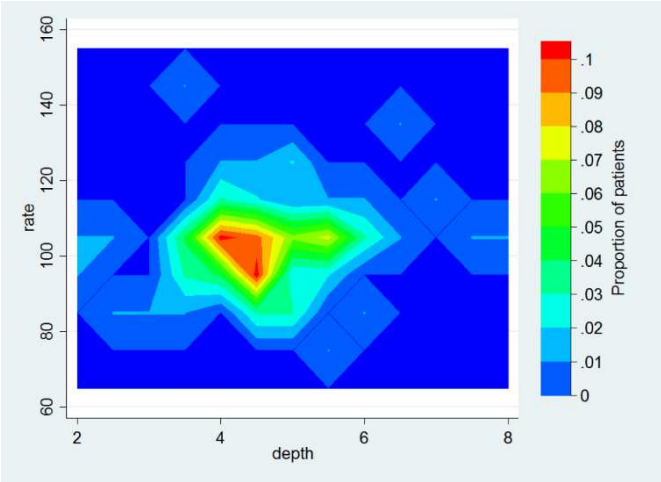
(Contour plots of all ROC survivors using proportion of good survivors in each cell and canonical analysis for optimization)

Sham ITD



Rate = 108 cpm
Depth = 4.6 cm

Active ITD



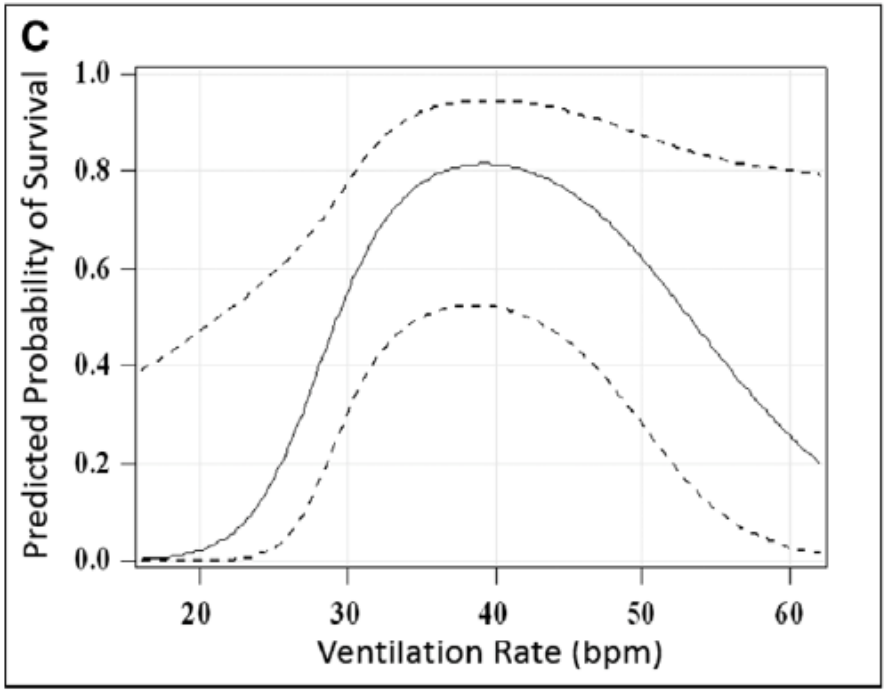
Rate = 106 cpm
Depth = 4.8 cm

Ventilation Rates and Pediatric In-Hospital Cardiac Arrest Survival Outcomes*

Robert M. Sutton, MD, MSCE[1]; Ron W. Reeder, PhD[2]; William P. Landis, BSE[1]; Kathleen L. Meert, MD[3]; Andrew R. Yates, MD[4]; Ryan W. Morgan, MD, MTR[1]; John T. Berger, MD[5];

Crit Care Med. 2019 Nov;47(11):1627-1636

Étude prospective observationnelle



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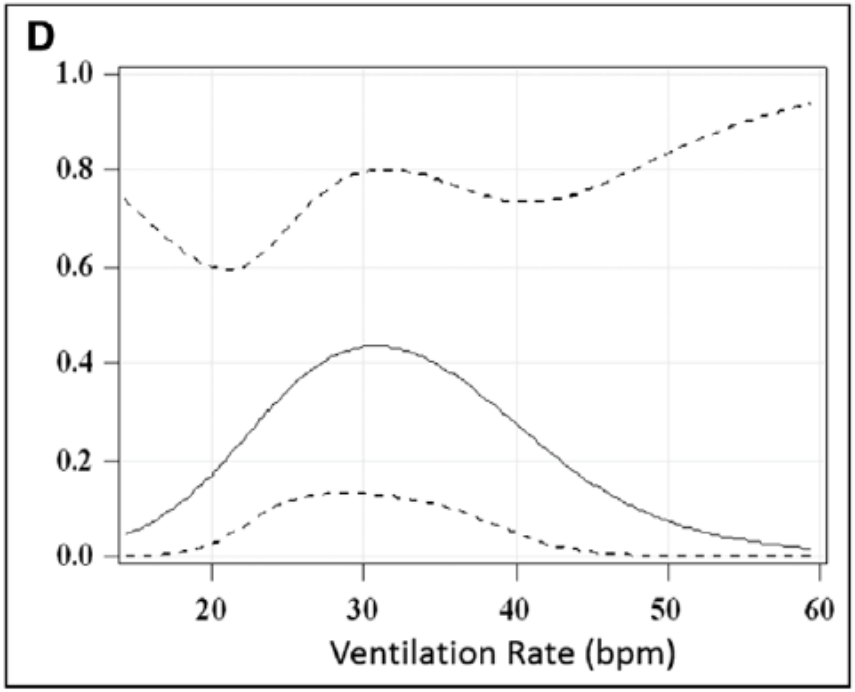


1 à 18 ans

Revisiter les recommandations de RCP pédiatriques ?

TIME TO COOLING

Time to intra-arrest hypothermia and its association with neurologic outcome

PRINCESS TRIAL

1. SUMMARY PRINCESS
2. TIME ASSOCIATION
3. POOLED ANALYSIS

Per Nordberg, MD, PhD,
Center for Resuscitation Science,
Karolinska Institutet, Stockholm, Sweden

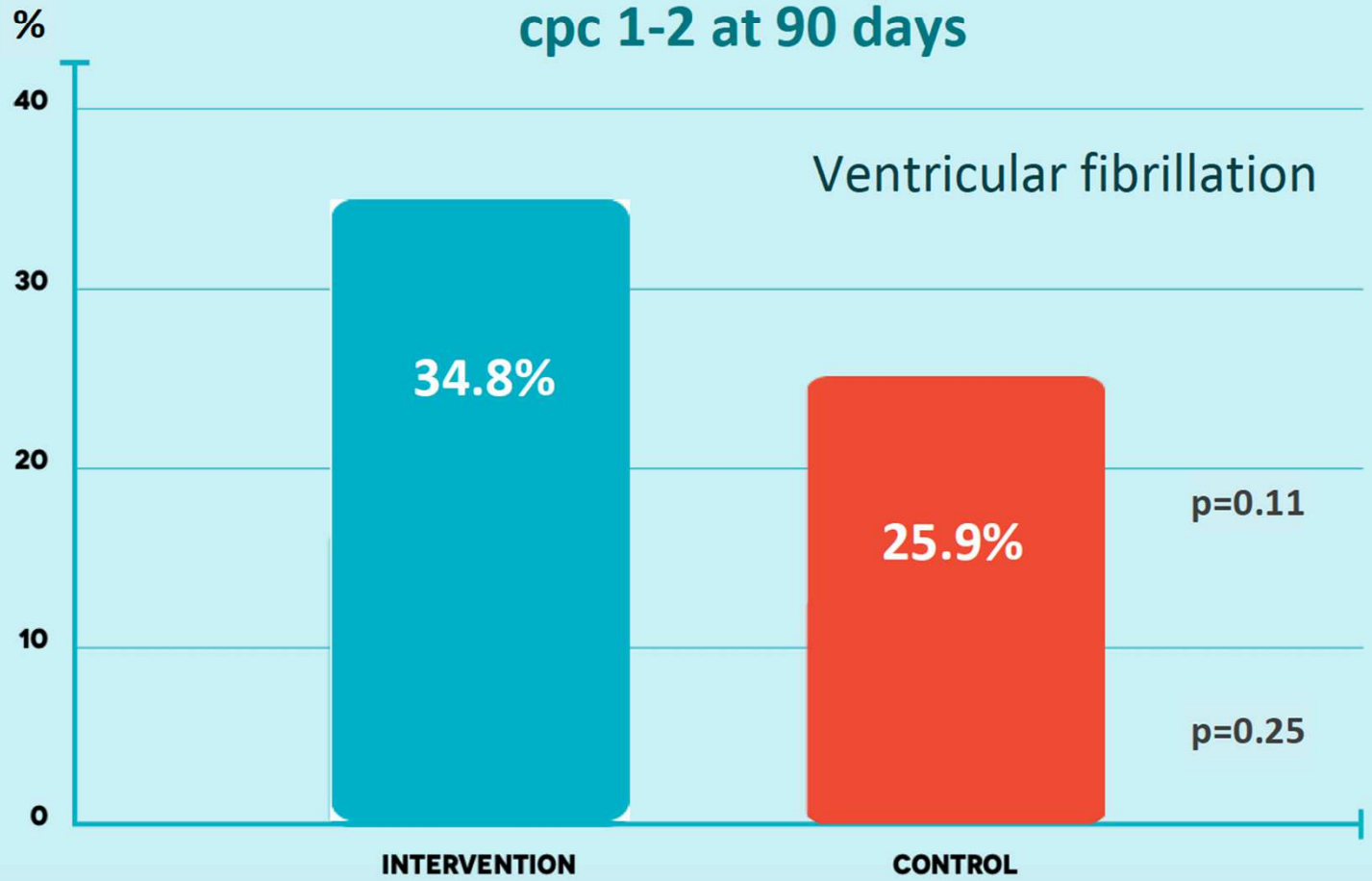
DISCLOSURES:
Laerdal Foundation
Swedish Heart and Lung Foundation
BrainCool AB – provided
cooling devices without cost

Cooling method

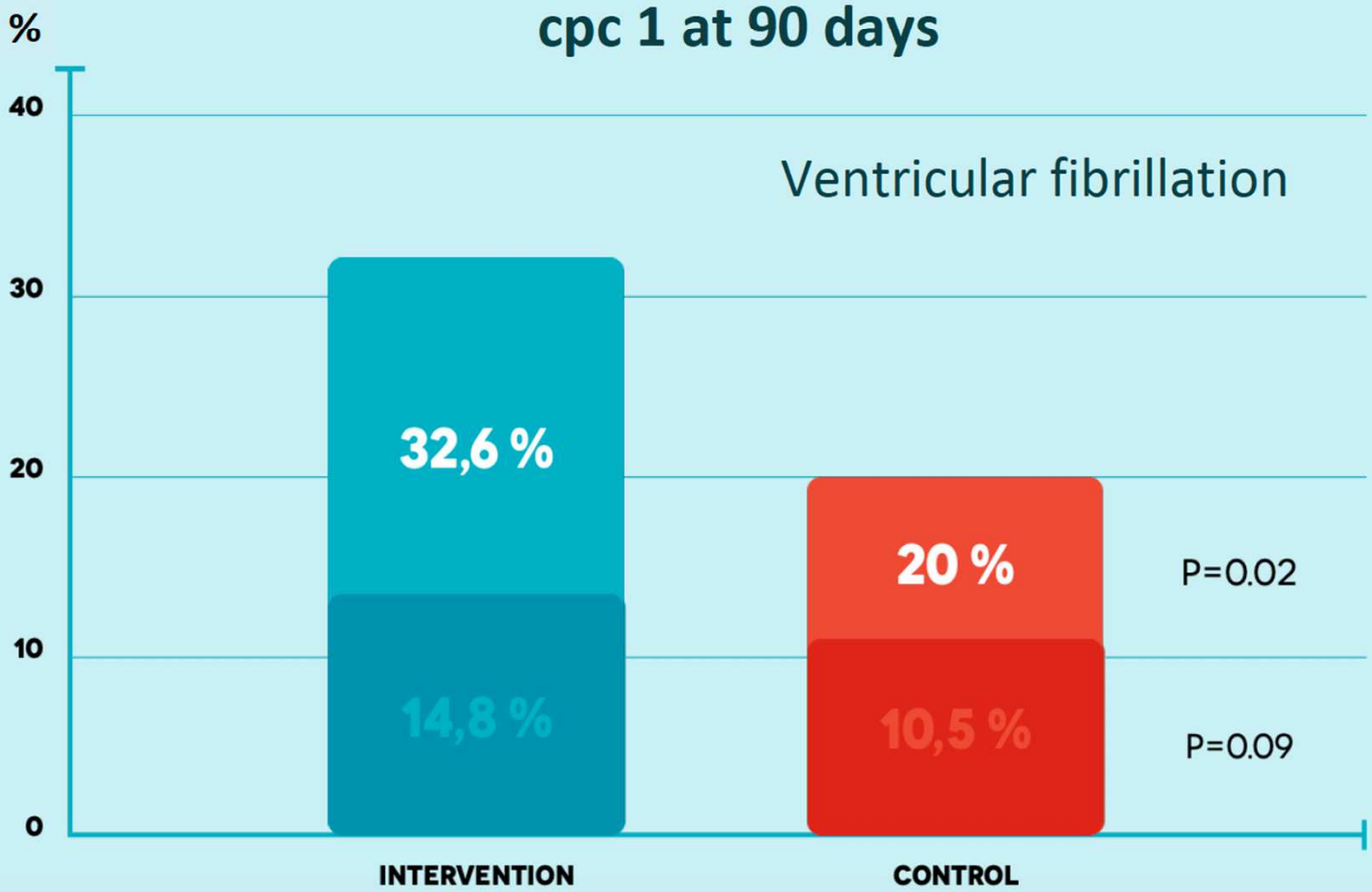
TRANSNASAL EVAPORATIVE COOLING

- **Primarily brain cooling**
- **Easy to use, early initiation**
- **Non-invasive**
- **Continuous cooling**
- **No volume load**

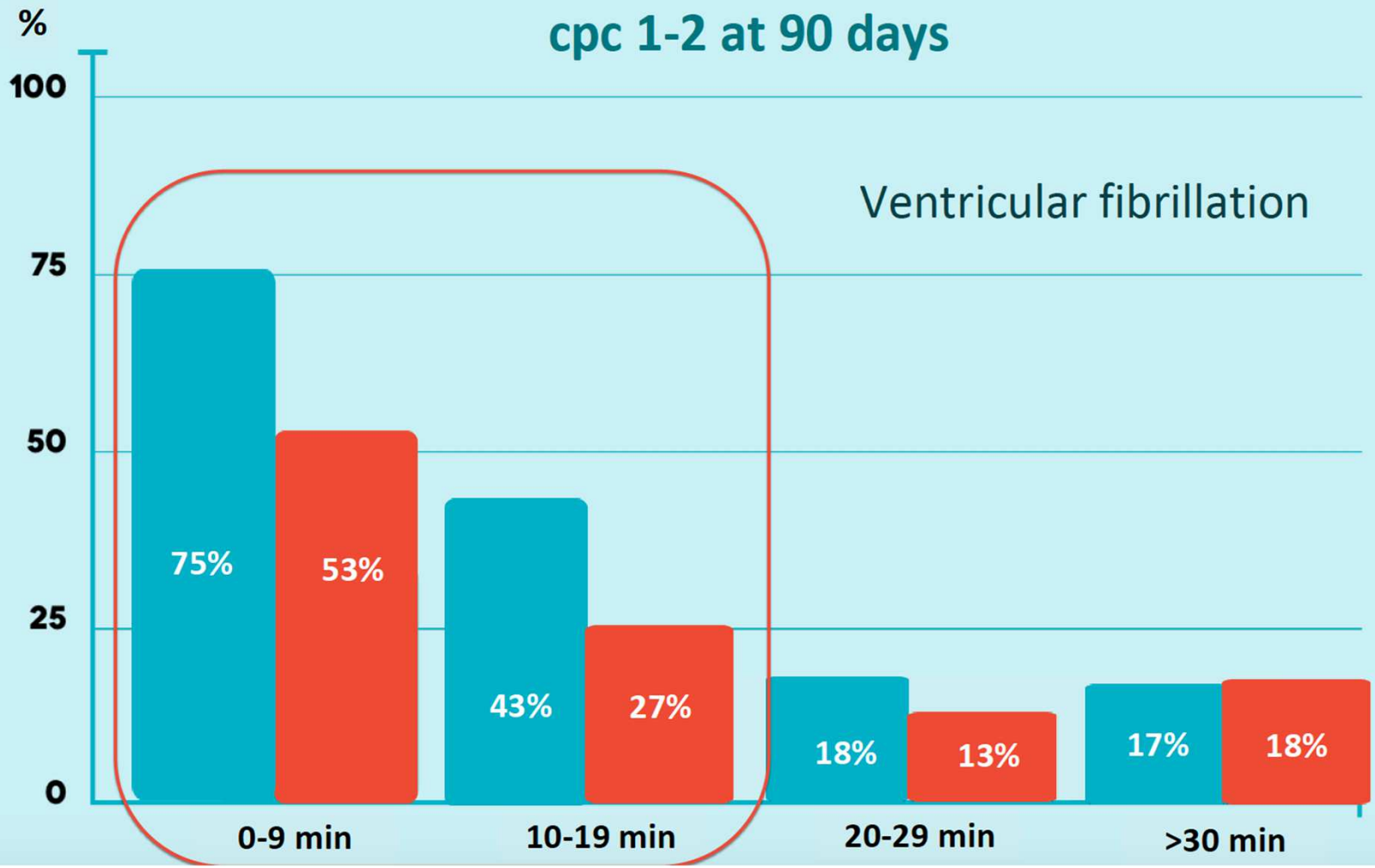
PRIMARY OUTCOME



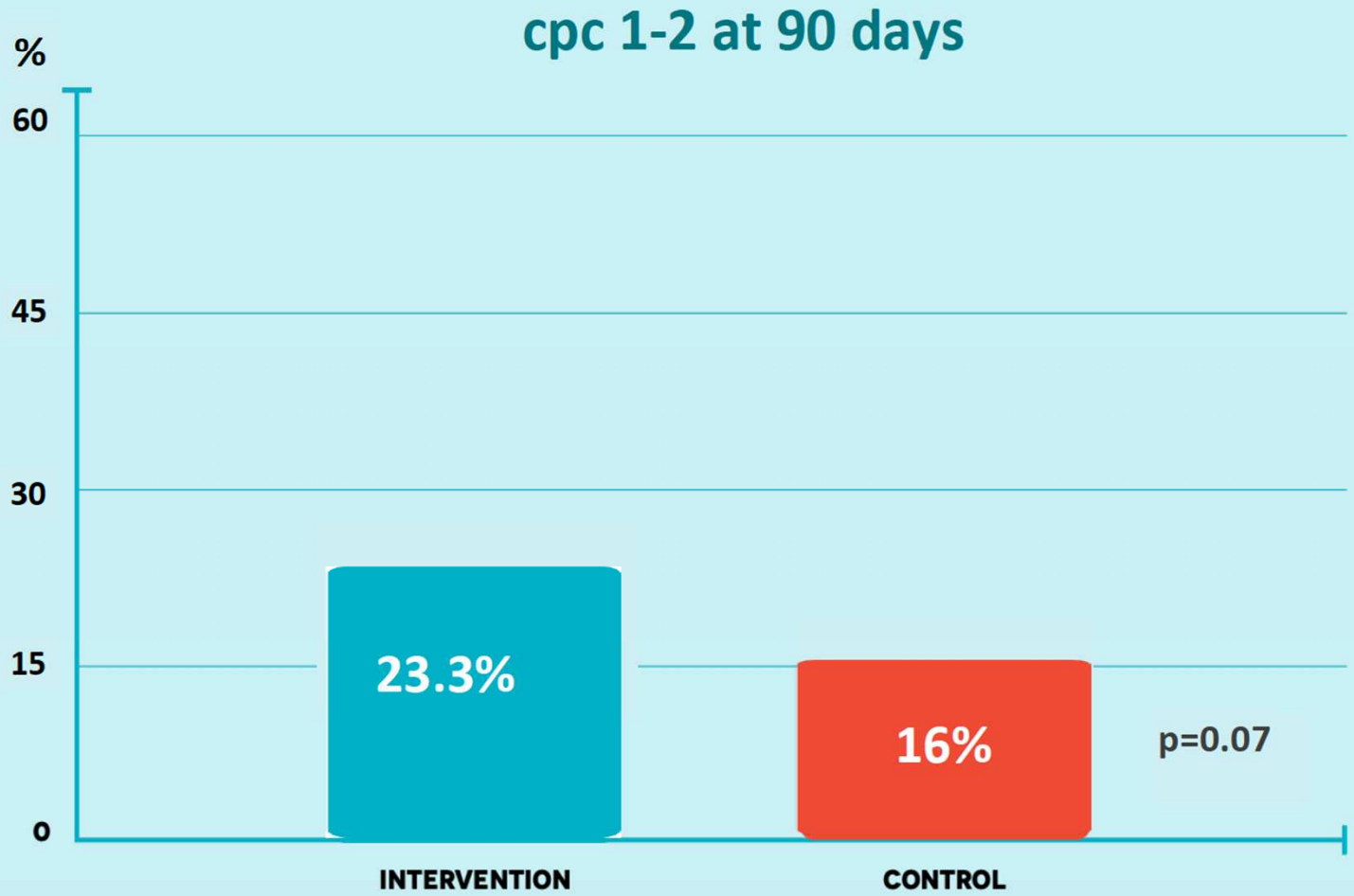
Complete recovery



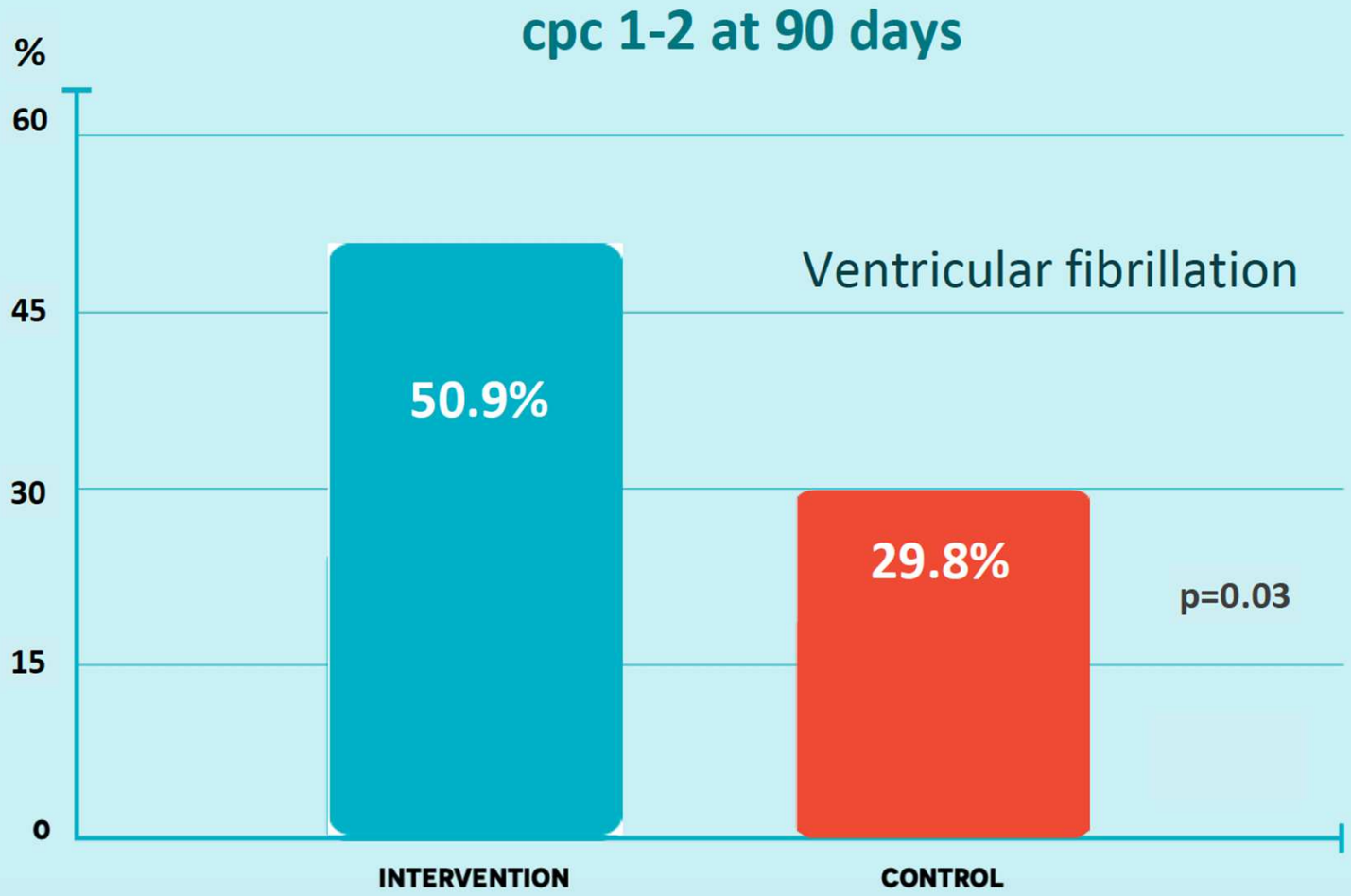
TIME TO randomization



TIME TO cooling <20 min



TIME TO cooling <20 min



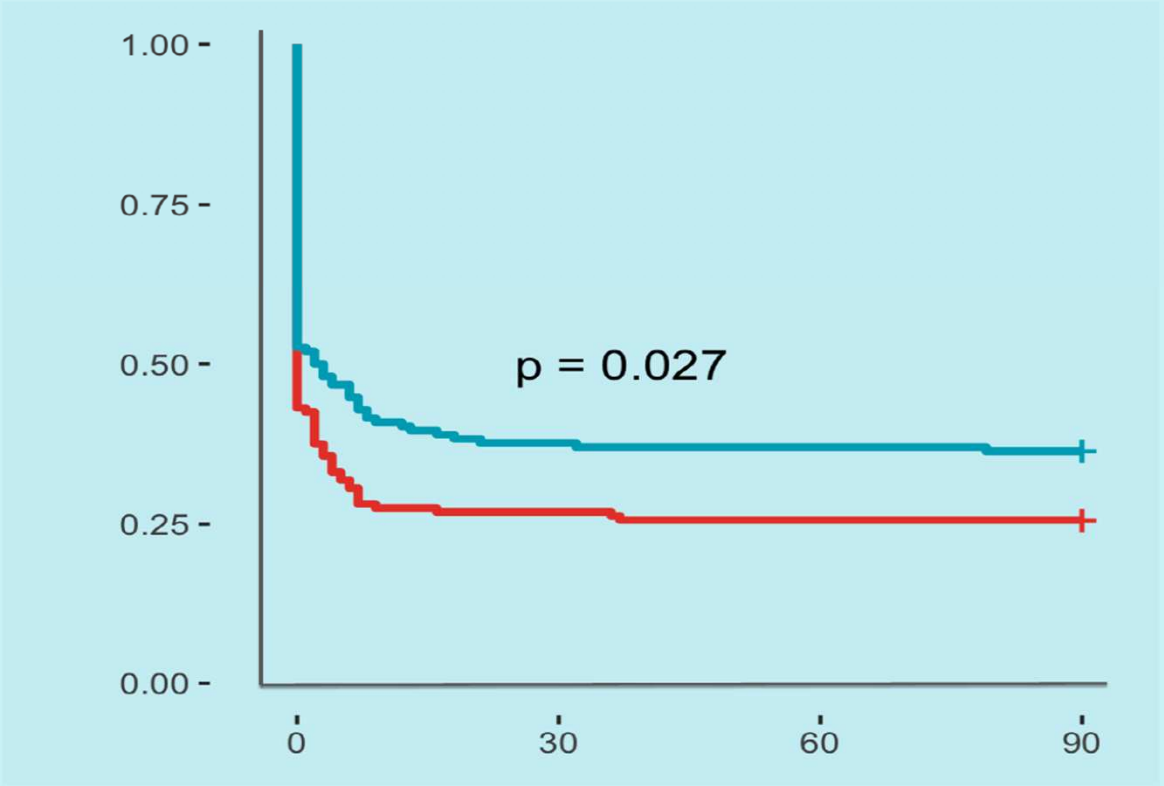
PRINCE AND PRINCESS TRIALS, 858 PATIENTS

POOLED ANALYSIS BY INITIAL RHYTHM

Kaplan Meier curve

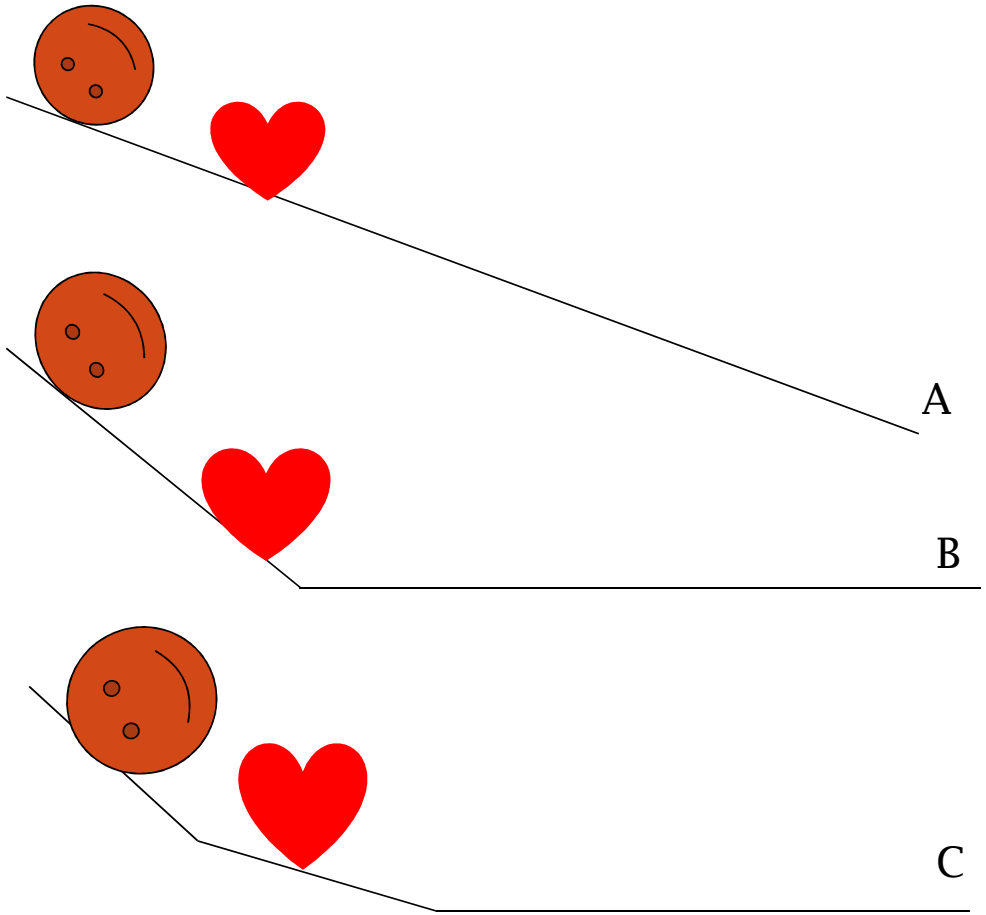
SHOCKABLE RHYTHMS

Survival with cpc 1-2 at 90 days



Control -	160	43	41	41
Intervention -	154	58	57	56

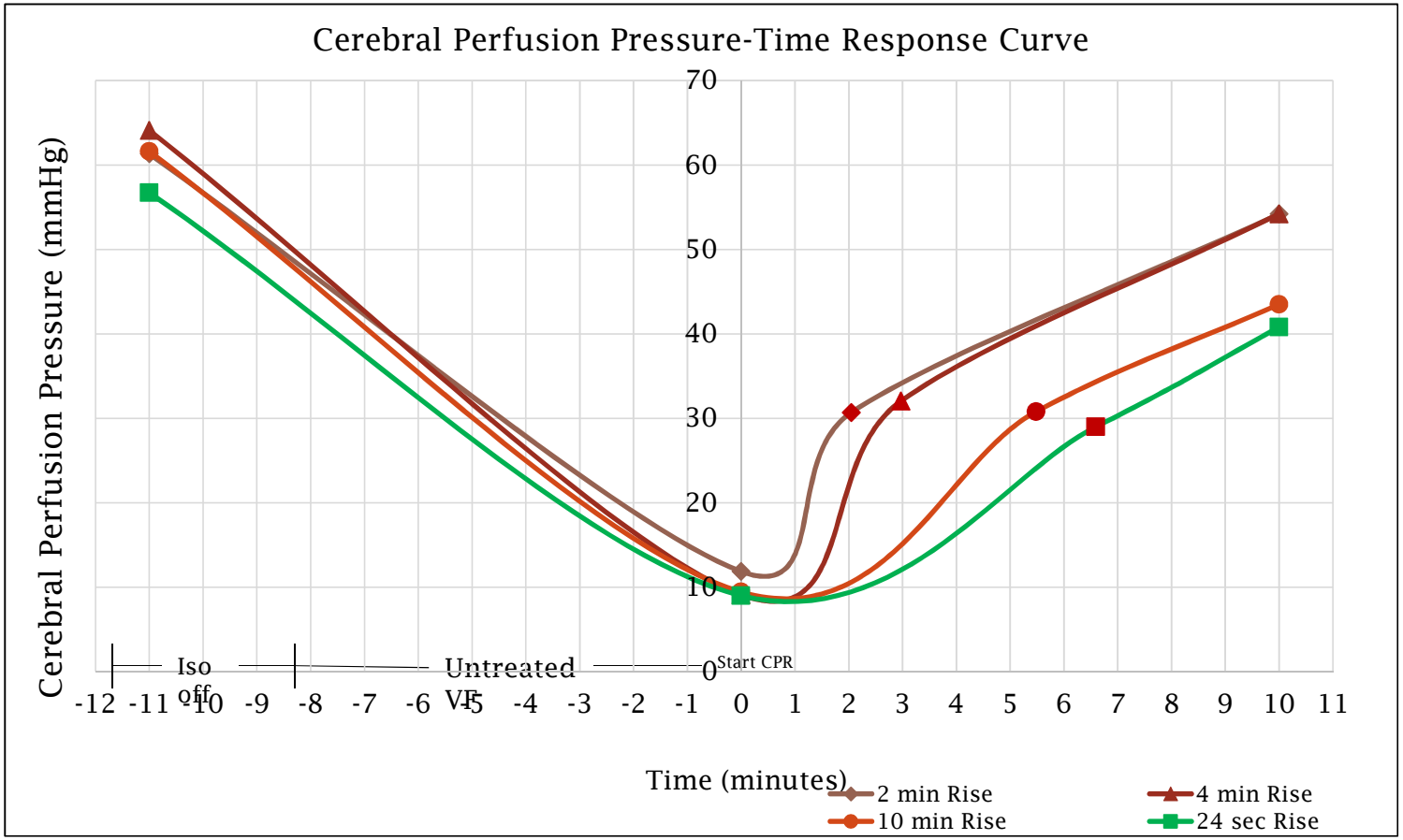
DIFFERENTIAL HEART AND BRAIN ELEVATION: EVOLUTION OF HEAD UP CPR



Benefits of C

Venous drainage from head
Decreases concussive effect
Lower RA pressure
Higher CerPP, CorPP
Higher Cerebral Blood Flow
Preserves central blood volume
Enhances R to L circulation?

Optimiser le temps d'elevation de la tête et du tronc



Time to 50% of baseline CerPP <2.5 minutes

Rojas et al. AHA 2019

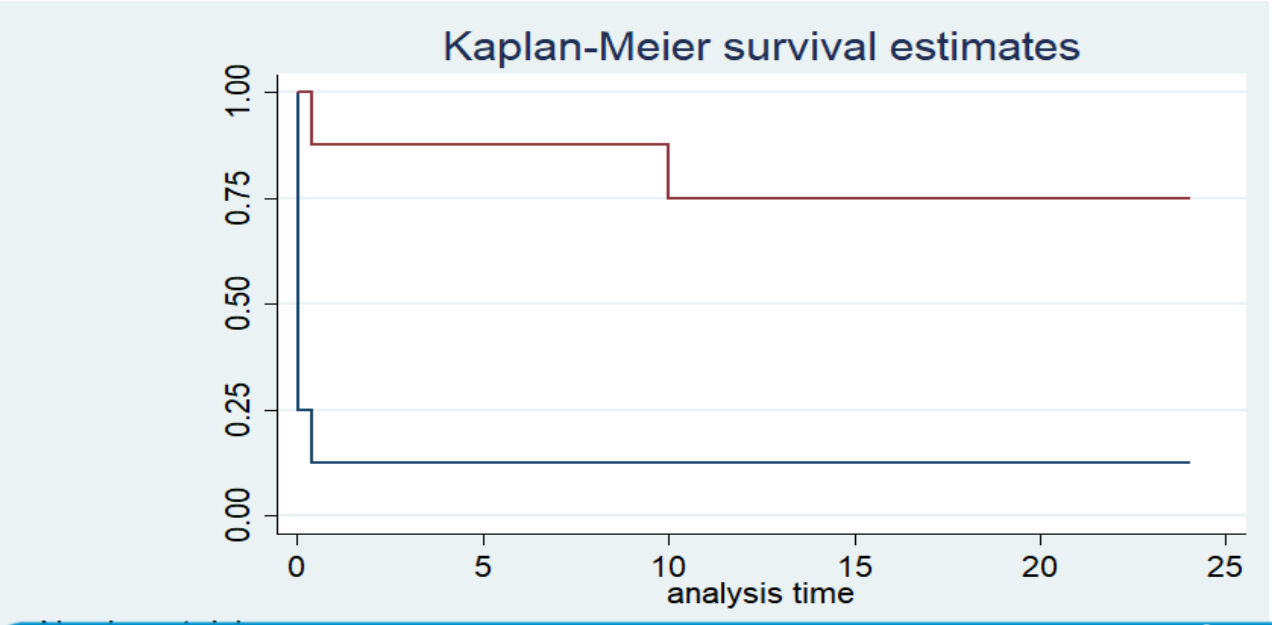
Survie chez l'animal

ROSC:

8/8 (100%) with Controlled Sequential Elevation versus **2/8 (25%)** for C-CPR (p = 0.002)

Cerebral Performance Category 1 or 2:

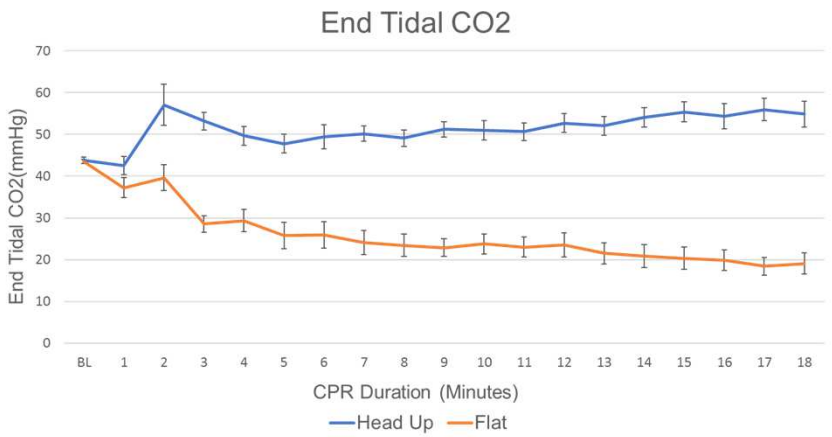
6/8 (75%) with Controlled Sequential Elevation versus **1/8 (12.5%)** with C-CPR (p=0.012)

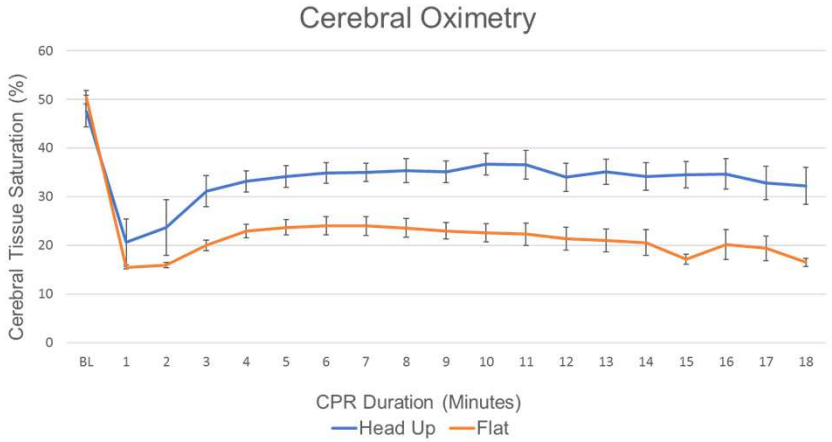


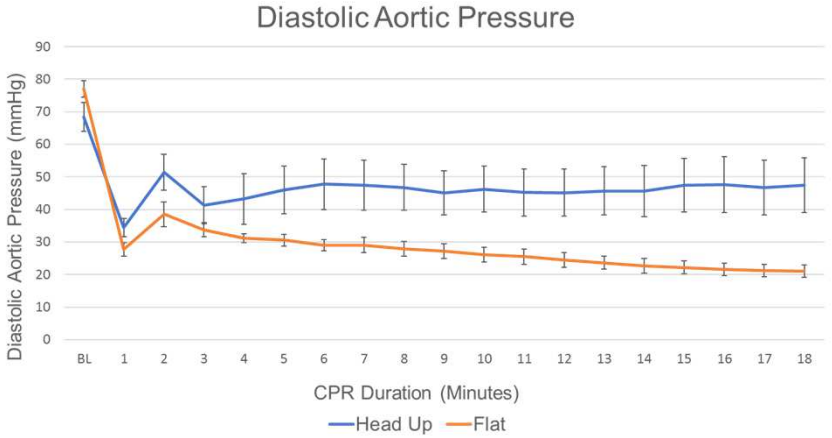
Overall survival and neurologically intact survival 6-fold higher
with sequential elevation of head and thorax with ACD+ITD CPR

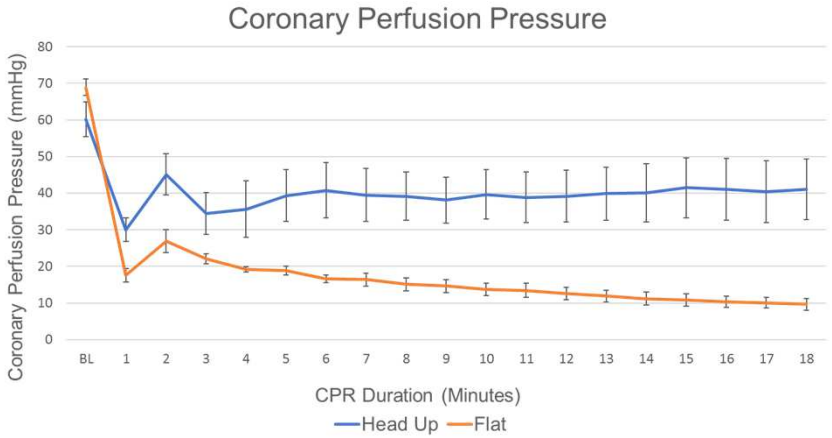
Moore et al, AHA 2019

Survival Study Hemodynamics









Moore et al AHA Scientific Sessions 2019

PALM BEACH COUNTY FLORIDA HEAD UP CPR EXPERIENCE (2014-2016)

Protocol Changes in 2015

1) Ensure proper use of mechanical CPR
2) Apply O_2 but defer ventilation 6 mins;
3) Apply impedance threshold device;
4) Automated CPR
5) Raise the backboard 30° (head/torso up position).

Confirming the Clinical Safety and Feasibility of a Bundled Methodology to Improve Cardiopulmonary Resuscitation Involving a Head-Up/Torso-Up Chest Compression Technique

Paul E. Pepe, MD, MPH, MCCM, MACP, FAEMS[1,2]; Kenneth A. Scheppke, MD[2];
Peter M. Antevy, MD[2]; Remle P. Crowe, PhD, NREMT[3]; Daniel Millstone, EMT-P[2];
Charles Coyle, EMT-P[2]; Craig Prusansky, EMT-P[2]; Sebastian Garay, EMT-P[2]; Richard Ellis, EMT-P[2];
Raymond L. Fowler, MD, FACEP, FAEMS[1]; Johanna C. Moore, MD, MPH[4]

Critical Care Medicine 2019

2100 CASES FROM 2014-2016
PALM BEACH COUNTY OUTCOMES: SURVIVAL TO HOSPITAL ADMISSION

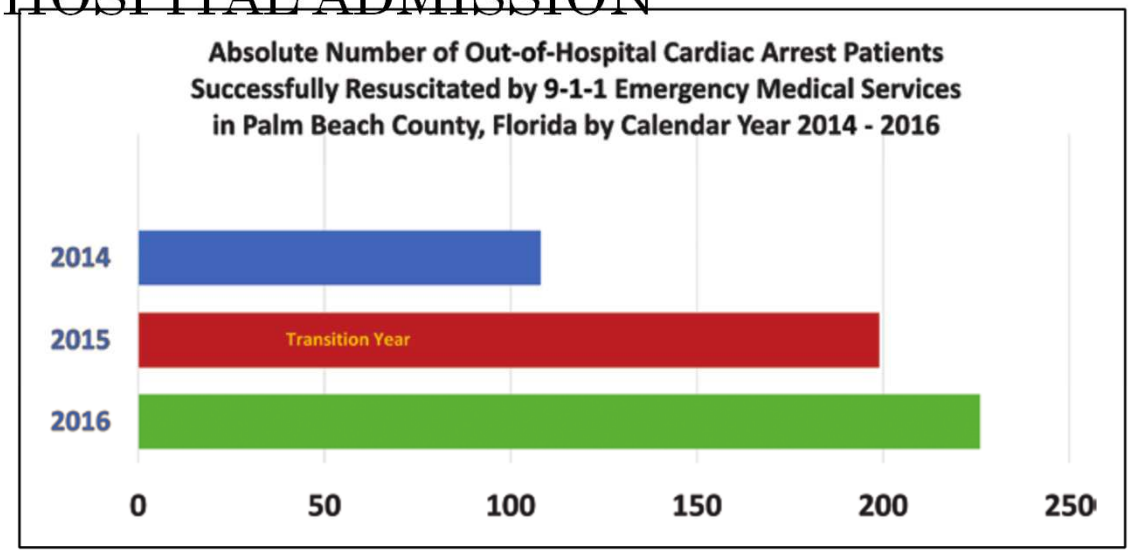


Figure 4. The raw number of patients resuscitated by emergency medical services teams who were successfully delivered to the emergency department alive with sustained circulation for the calendar years 2014, 2015 (the year of transition with inclusion of head-up cardiopulmonary resuscitation), and 2016, respectively.

All patient rhythms	Before	After	p value
	17.9%.	34.2%	<0.001

Outcome improved across all subgroups while response intervals, indications for initiating CPR, and bystander CPR rates were unchanged


1-C
STOP
00:02

Arrêt cardiaque – l’année 2019 en revue

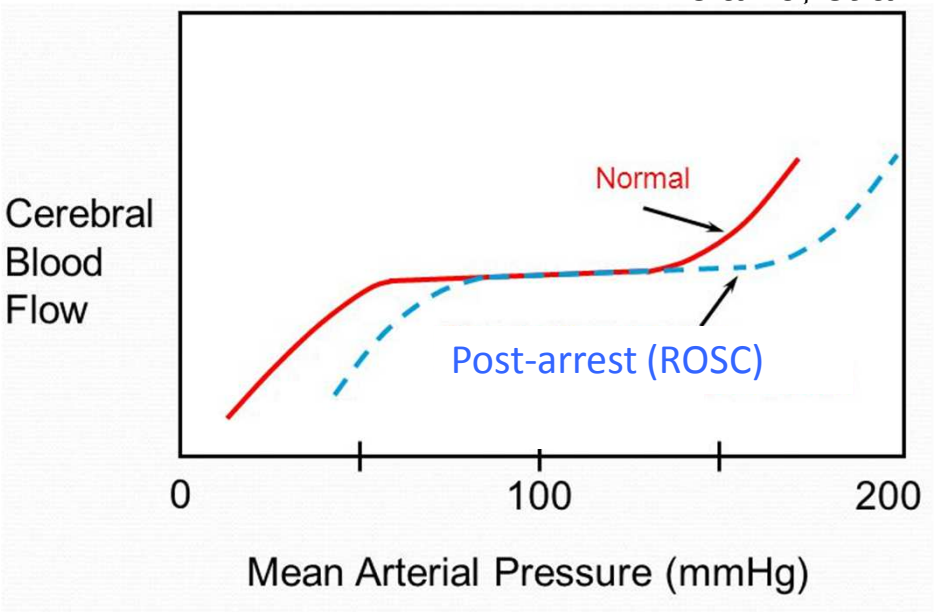
RCP
Fréquence et
Ventilation

Post ROSC
Hémodynamique
Ventilation
Hypothermie

Evidence-base pour optimiser l'hémodynamique

Autoregulation of cerebral blood flow shifted to the right in patients with ROSC.

Nolan J, et al Resuscitation 2016



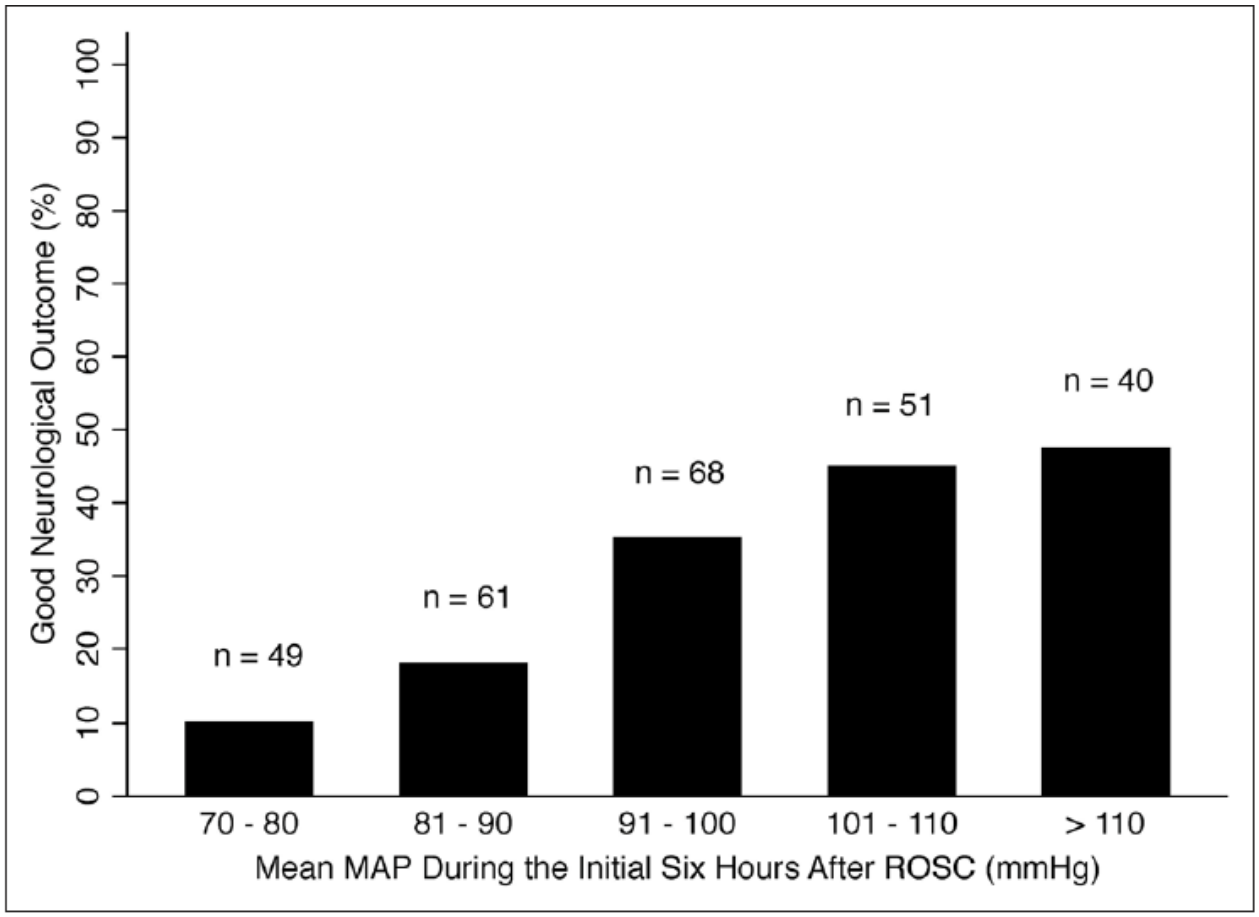
Hypotension occurring during the first six hours after cardiac arrest is an independent predictor of poor one-year neurological outcome.

Laurikkala J, et al, Resuscitation 2016

Courtesy of Charles Deakin

Association Between Elevated Mean Arterial Blood Pressure and Neurologic Outcome After Resuscitation From Cardiac Arrest: Results From a Multicenter Prospective Cohort Study*

Crit Care Med 2019; 47:93–100



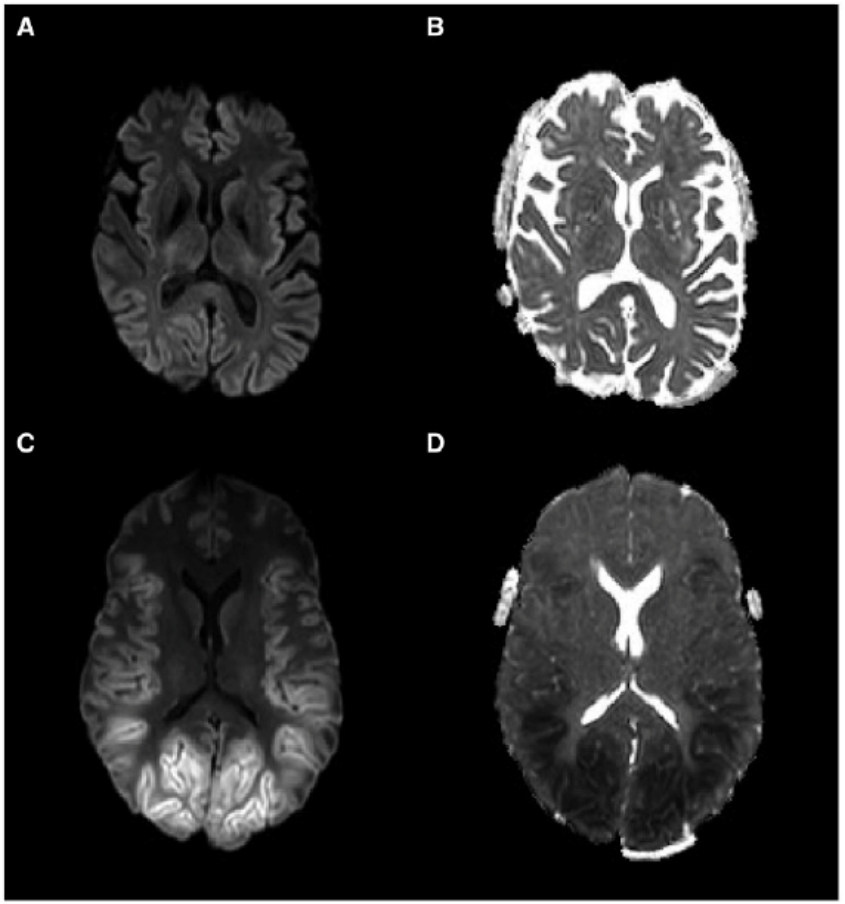
ESC European Society of Cardiology
European Heart Journal (2019) **00**, 1–11
doi:10.1093/eurheartj/ehz120

FASTTRACK CLINICAL RESEARCH
Disease management

Early goal-directed haemodynamic optimization of cerebral oxygenation in comatose survivors after cardiac arrest: the Neuroprotect post-cardiac arrest trial

Koen Ameloot[1,2,3]*, Cathy De Deyne[3,4], Ward Eertmans[3,4], Bert Ferdinande[1],

112 patients randomisés
Cible **MAP à 65mmHg** vs. Cible hémodynamique avec **MAP-80-100 + SVO2 65-75%**
CPJ : lésion cérébrale anoxique à l'IRM



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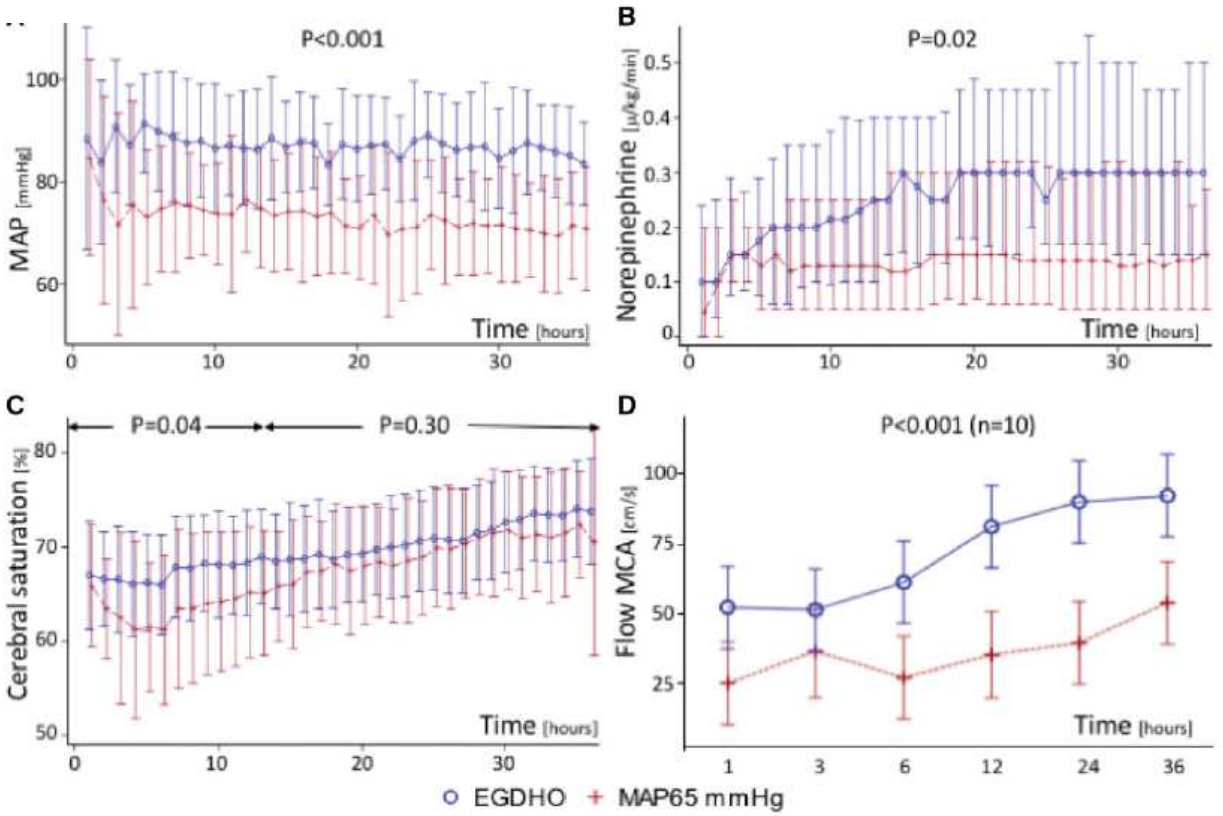
Koen Ameloot[1,2,3]*, Cathy De Deyne[3,4], Ward Eertmans[3,4], Bert Ferdinande[1],

Cible avec MAP-80-100 + SVO2 65-75%

- **Amélioration la perfusion cérébrale et oxygénation**
- **Pas de diminution significative des lésions IRM (p=0,09)**



Optimiser l’hémodynamique

Objectif :

PAM > 65 mmHg ou 80-100 mmHg

Optimisation précharge

Noradrénaline en 1ère intention

Circulation

ORIGINAL RESEARCH ARTICLE

Association Between Early Hyperoxia Exposure After Resuscitation From Cardiac Arrest and Neurological Disability

Prospective Multicenter Protocol-Directed Cohort Study

260 patients
Hyperoxie 38%

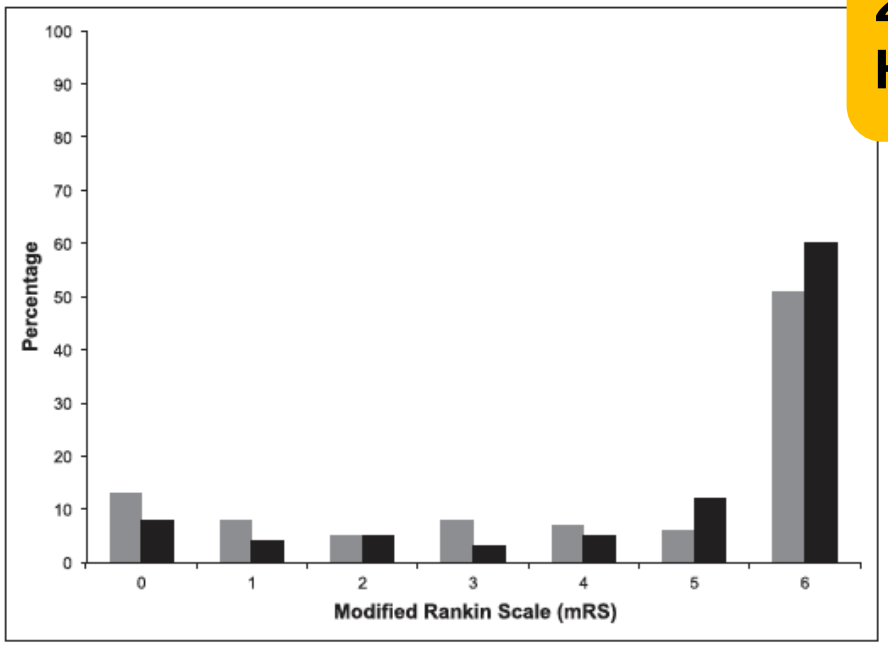


Figure 2. mRS score at hospital discharge stratified by no hyperoxia (gray columns) and hyperoxia (black columns).
An mRS score of 0 indicates no symptoms; 1, no significant disability; 2, slight disability; 3, moderate disability; 4, moderate-severe disability; 5, severe disability; and 6, death.

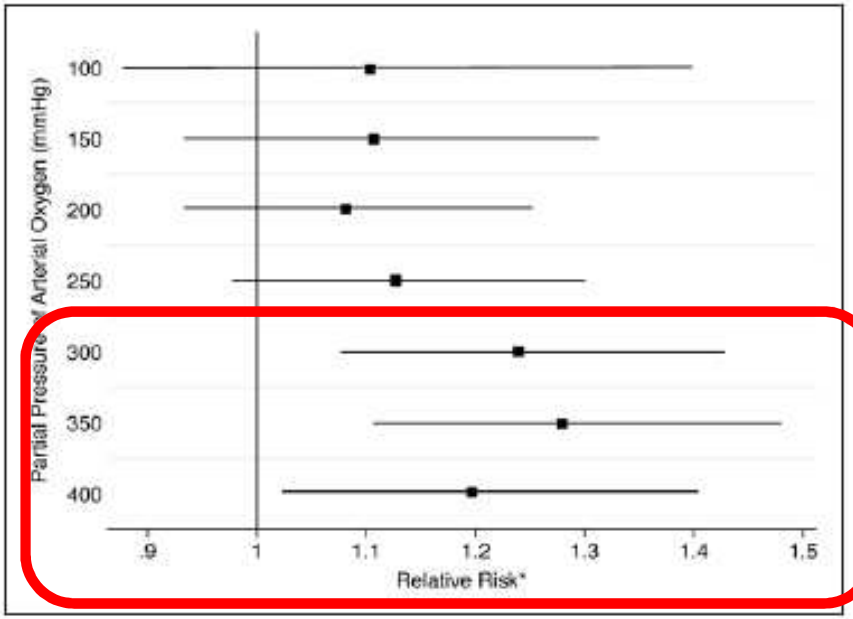


Figure 3. Adjusted relative risks (squares) with 95% confidence intervals (horizontal lines) for poor neurological outcome (defined as modified Rankin Scale [mRS] score >3) across ascending cut points to define hyperoxia.

Optimiser l’hémodynamique et la ventilation

- **PAM > 65 mmHg ou 80-100 mmHg**
- **Assurer une ventilation protectrice**
  - Réduction des complication pulmonaire
  - Réduction de la mortalité hospitalière
  - Diminution des lésions de reperfusion
- **Adapter FiO2 ++**
- **FR 10-15 /min (probablement plus 15-20/min)**
- **VC 6 ml/kg – adapter PEEP>5mmHg**
- **Monitoring continu de l’EtCO2**

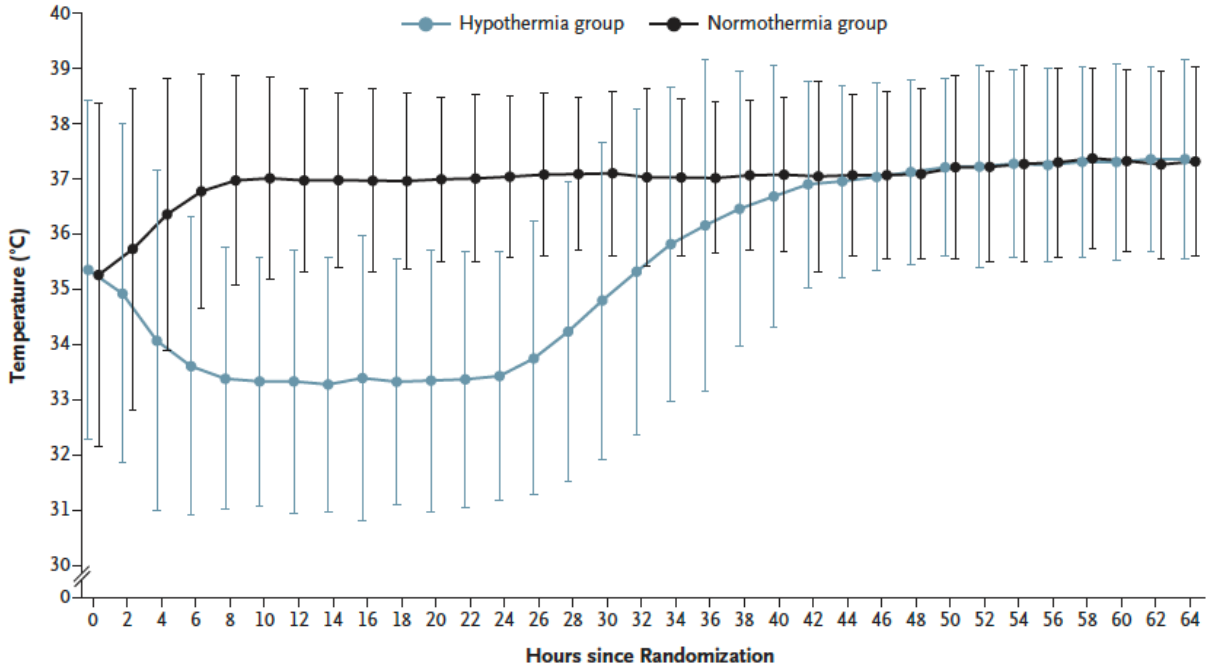
ORIGINAL ARTICLE

Targeted Temperature Management for Cardiac Arrest with Nonshockable Rhythm

J.-B. Lascarrou, H. Merdji, A. Le Gouge, G. Colin, G. Grillet, P. Girardie, E. Coupez, P.-F. Dequin, A. Cariou, T. Boulain, N. Brule, J.-P. Frat, P. Asfar, N. Pichon, M. Landais, G. Plantefeve, J.-P. Quenot, J.-C. Chakarian, M. Sirodot, S. Legriel, J. Letheulle, D. Thevenin, A. Desachy, A. Delahaye, V. Botoc, S. Vimeux, F. Martino, B. Giraudeau, and J. Reignier, for the CRICS-TRIGGERSEP Group*

N Engl J Med. 2019 Oct 2

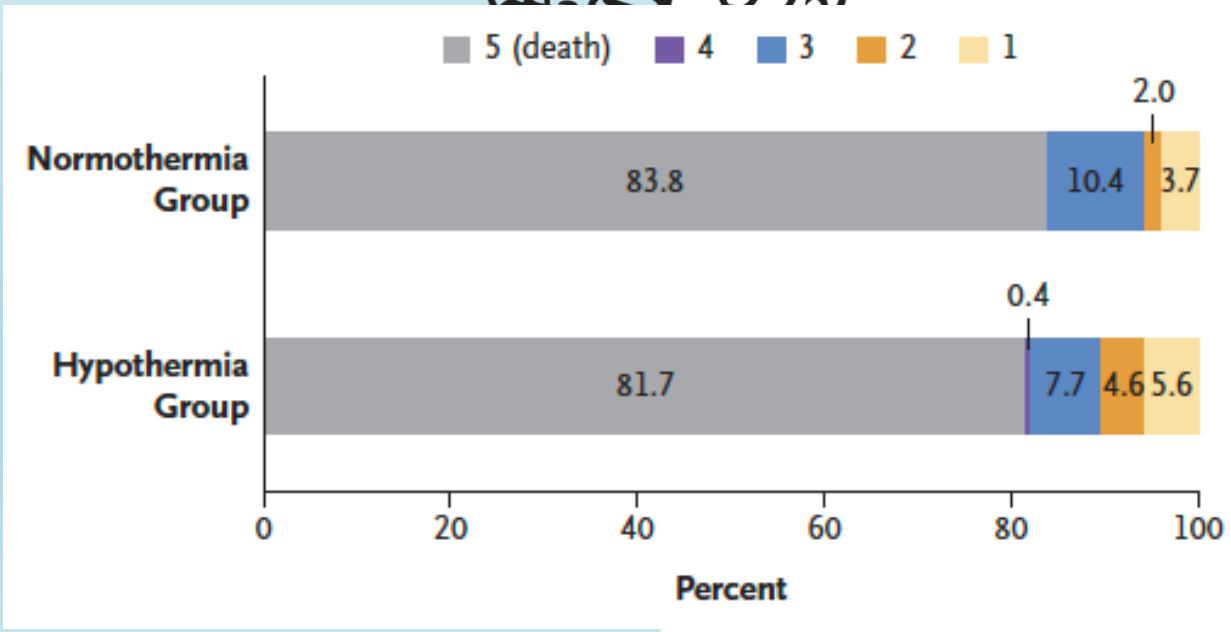
Étude randomisée contrôlée
584 patients
Rythme non choquable



Bon devenir neurologique à 90J

Hypothermie

Normothermie

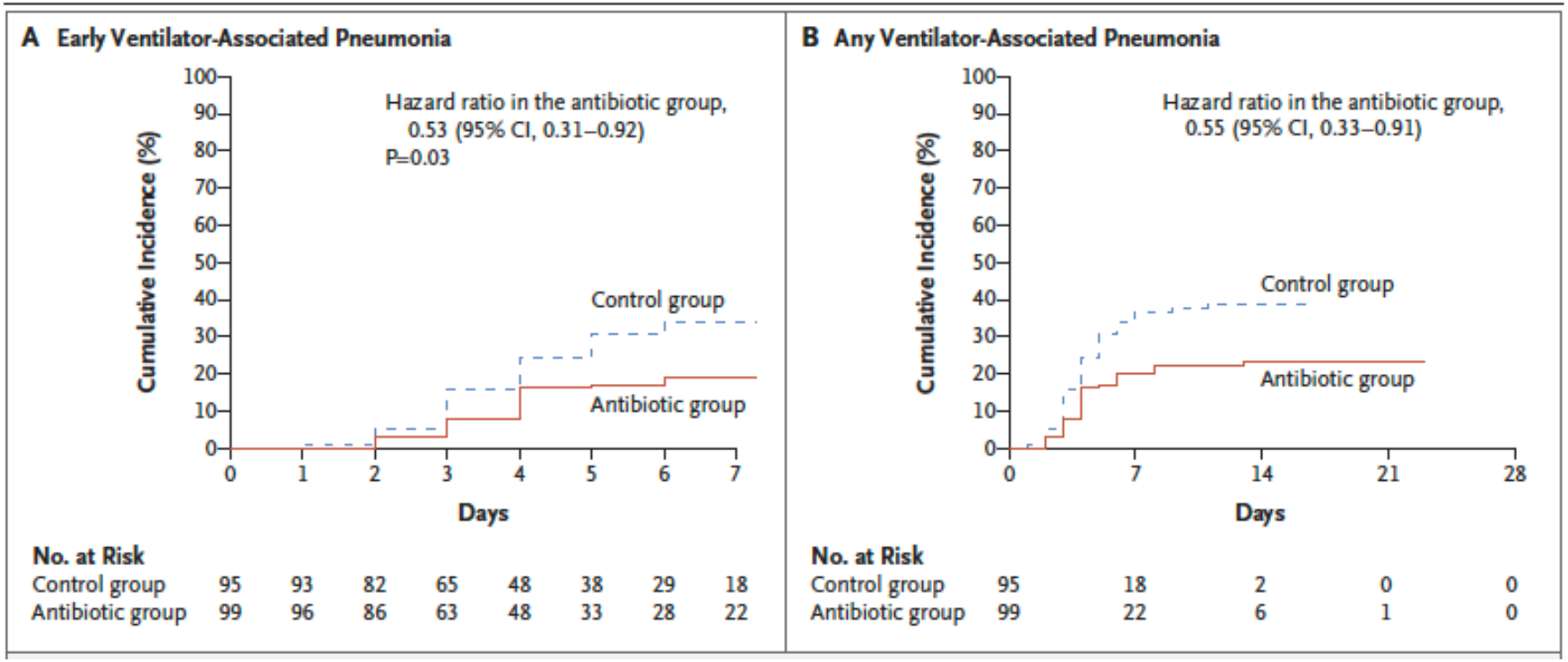


Prevention of Early Ventilator-Associated Pneumonia after Cardiac Arrest

B. François, A. Cariou, R. Clere-Jehl, P.-F. Dequin, F. Renon-Carron, T. Daix, C. Guitton, N. Deye, S. Legriel, G. Plantefève, J.-P. Quenot, A. Desachy, T. Kamel, S. Bedon-Carte, J.-L. Diehl, N. Chudeau, E. Karam, I. Durand-Zaleski, B. Giraudeau, P. Vignon, and A. Le Gouge, for the CRICS-TRIGGERSEP Network and the ANTHARTIC Study Group*

N Engl J Med. 2019 nov 7

Étude randomisée contrôlée
198 patients
Augmentin 1Gr pendant 2 jours



Brain – EX

SCIENCE

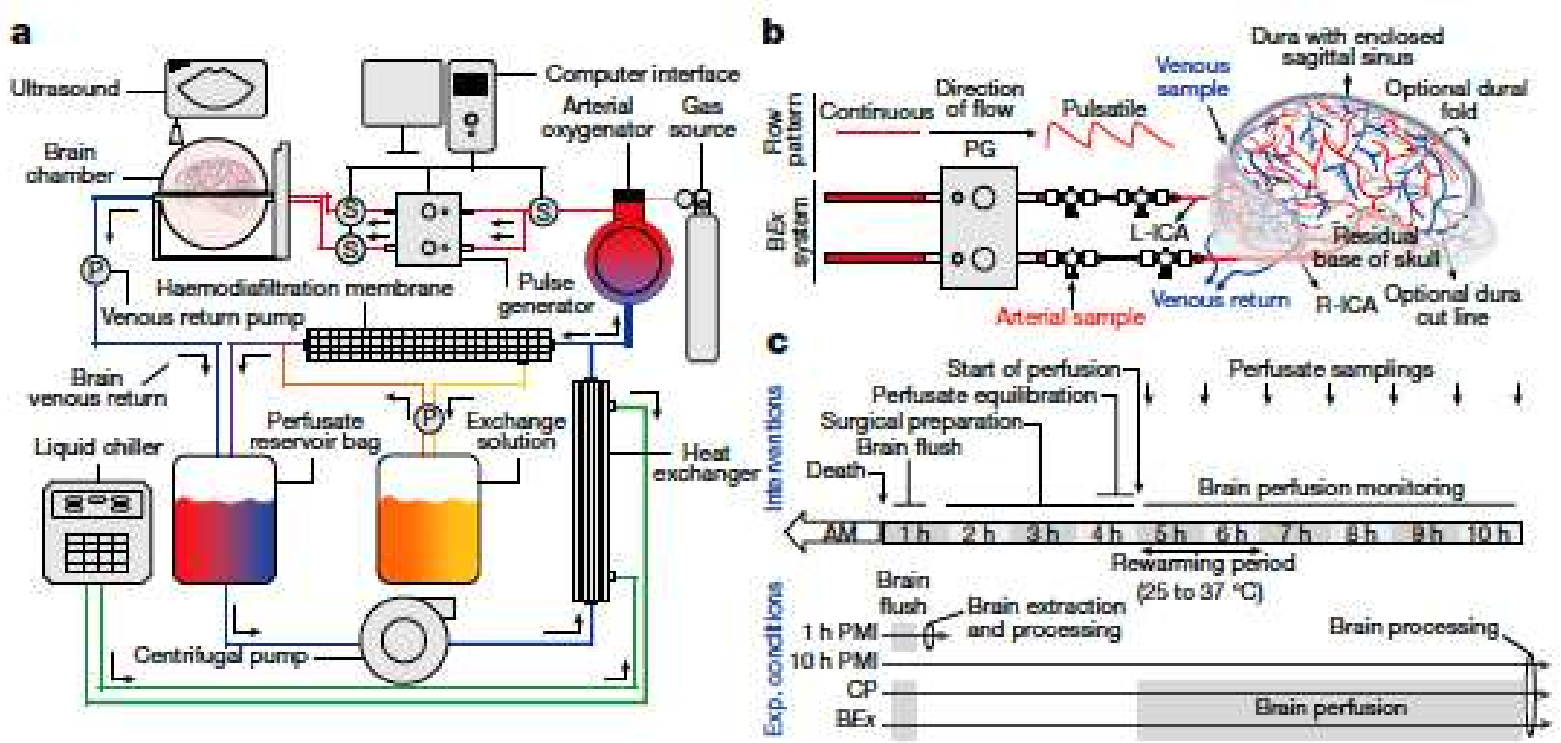
Pig brains partially revived hours after death—what it means for people

In a feat sure to fire up ethical and philosophical debate, a new system has restored circulation and oxygen flow to a dead mammal brain.

Restoration of brain circulation and cellular functions hours post-mortem

Zvonimir Vrselja[1,2,18], Stefano G. Daniele[1,2,3,18], John Silbereis[1,2], Francesca Talpo[1,2,4], Yury M. Morozov[1,2], André M. M. Sousa[1,2], Brian S. Tanaka[5,6,7], Mario Skarica[1,2], Mihovil Pletikos[1,2,8], Navjot Kaur[1,2], Zhen W. Zhuang[9], Zhao Liu[9,10], Rafeed Alkawadri[6,11], Albert J. Sinusas[9,10], Stephen R. Latham[12], Stephen G. Waxman[5,6,7] & Nenad Sestan[1,2,13,14,15,16,17]*

Nature 568, 336–343 (2019)



S.A.U.V
SAMU

Ajouter un nouvel arrêt cardiaque

Arrêts cardiaques en cours

Histoire

Profil Se deconnecter

14 Avenue Spinoza, 94200 Ivry-sur-Seine. 2ème étage. Près du pub Le Bistro.

Créé 30.07.2017 11:12

48 Boulevard Jourdan
75014 Paris

20 quarter Rue de la bellefeuille, 92100 Boulogne-Billancourt

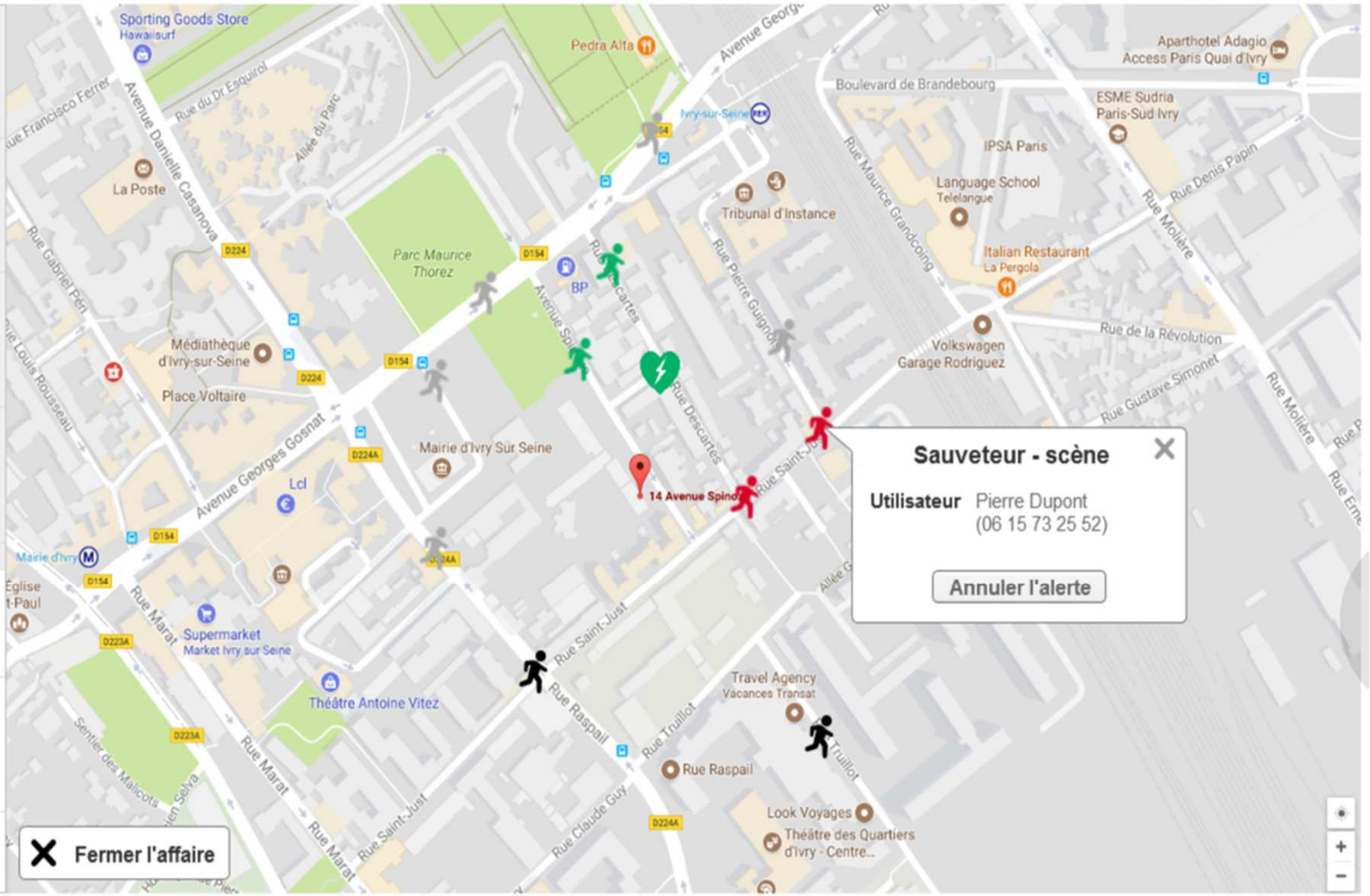
14 Avenue Spinoza
94200 Ivry-sur-Seine

3 Place d'Alleray
75015 Paris

14 Rue Marat,
75013 Paris

8 Rue Denis Papin,
75015 Paris

31 Rue Descartes,
94200 Ivry-sur-Seine



Scène d'arrêt cardiaque Défibrillateur Sauveteur - scène Sauveteur - défibrillateur Utilisateur alerté Utilisateur annulé

SAUV-LIFE en Isère

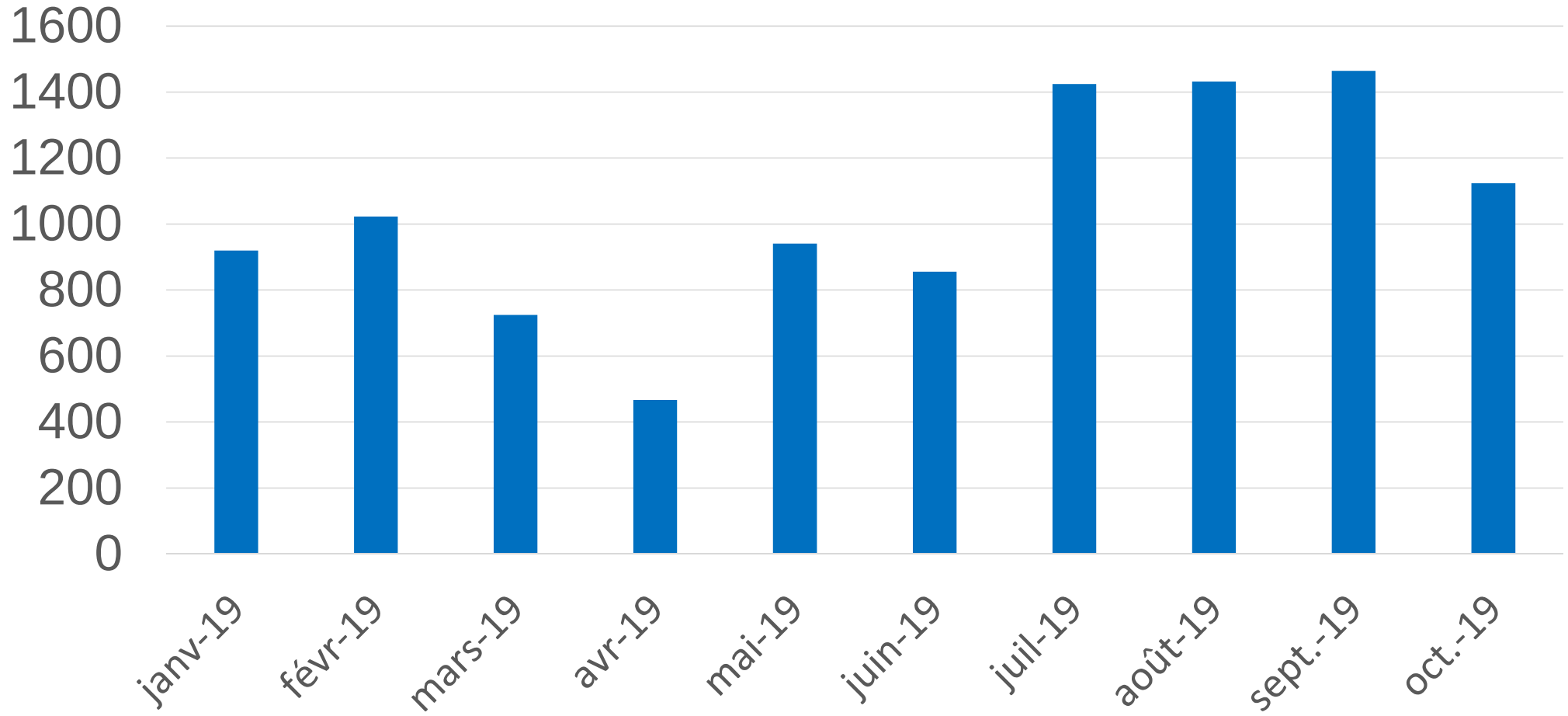
300 000 inscrits en France

9300 Inscrits en Isère dont :

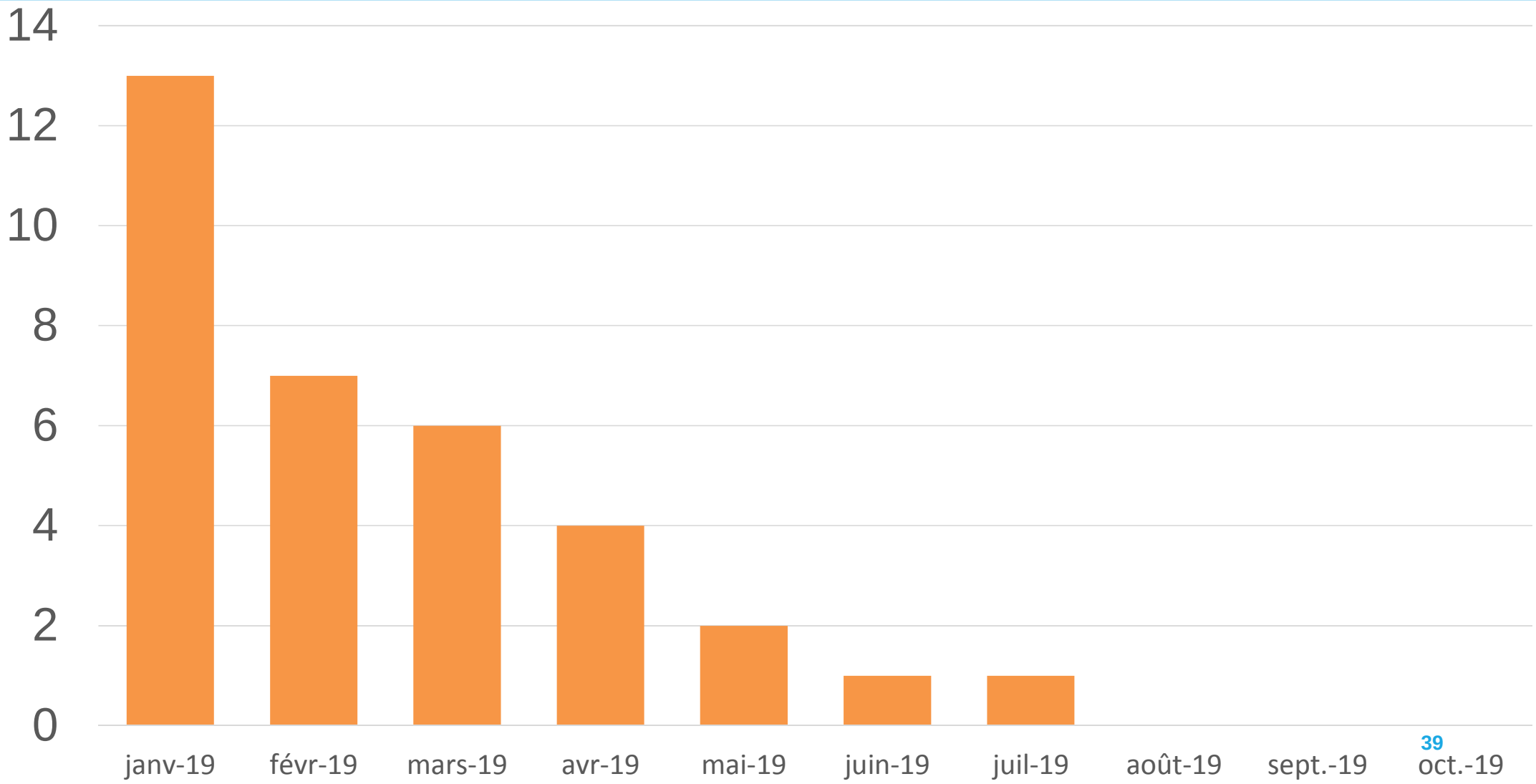
- 2300 secouristes
- 2200 professionnels de santé
- 3100 autres volontaires formés
- 1700 volontaires non formés

SAUV-LIFE en Isère – Nombre de SMS envoyés

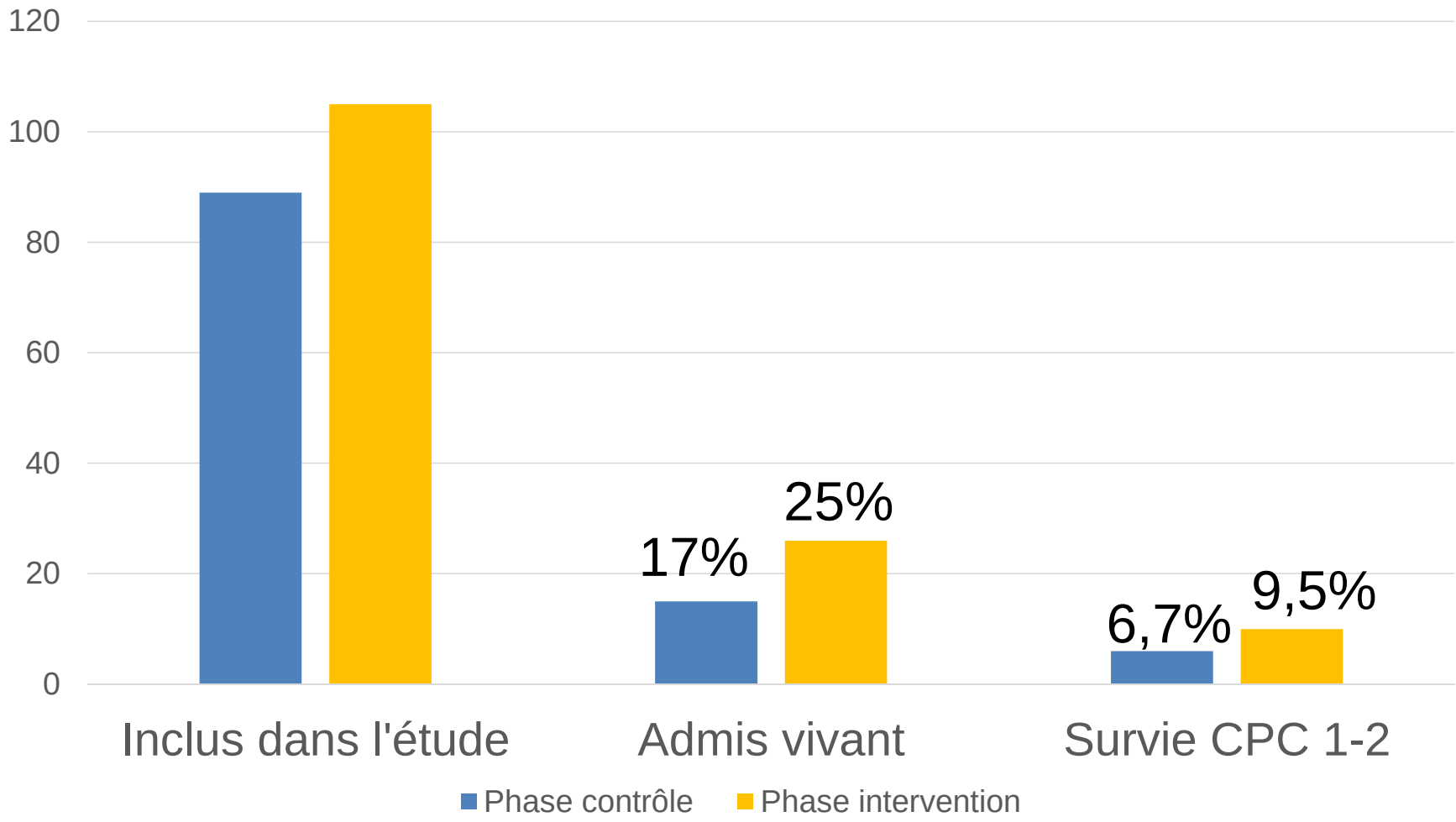
- 33 déclenchements par mois



Sauv-Life nombre de déclenchements sans sauveteurs



Sauv Life résultats Grenoble



Accepter la localisation permanente

Conclusion

Renforcer les 1er maillons de la chaine de survie

Rythme et profondeur chez l'enfant ?

Des nouveautés dans le post AC

- Hémodynamique
- Ventilation
- Hypothermie

SAUV life